

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A piezoelectric vibrator comprising:

a piezoelectric plate, having a polarization that points in a direction of a thickness of the piezoelectric plate, the piezoelectric plate having a first face and a second face;

a first electrode for covering the first face;

a second electrode for covering the second face;

a first dielectric film for covering the first electrode; and

a second dielectric film for covering the second electrode,

wherein the piezoelectric plate employs a thickness longitudinal vibration as a principal vibration,

the first dielectric film and the second dielectric film have substantially a same thickness and a substantially same area,

a ratio of a sum of a thickness (t_s) of the first dielectric film and the second dielectric film to the thickness (t_p) of the piezoelectric plate is provided in a range such that an electro-mechanical coupling factor is substantially constant,

wherein the range of the ratio (t_s/t_p) of the sum of the thickness of the first dielectric film and the second dielectric film to the thickness of the piezoelectric plate is between 0.7 and 2.0, inclusive, and

the first dielectric film and the second dielectric film are ~~disposed~~ formed to be substantially point symmetric with each other ~~with respect to a diagonal line extending~~

through a center of the piezoelectric plate across the first face and the second face of the piezoelectric plate.

2. (Original) The piezoelectric vibrator of claim 1,

wherein the piezoelectric plate is made of aluminum nitride.
3. (Original) The piezoelectric vibrator of claim 1,

wherein at least one of the first dielectric film and the second dielectric film is made of silicon oxide.
4. (Original) The piezoelectric vibrator of claim 1,

wherein at least one of the first dielectric film and the second dielectric film is made of silicon nitride.
5. (Previously Presented) The piezoelectric vibrator of claim 1,

wherein at least one of the first dielectric film and the second dielectric film is formed of a laminated layer of silicon oxide and silicon nitride.
6. (Original) The piezoelectric vibrator of claim 1,

wherein the principal vibration is a fundamental mode of the thickness longitudinal vibration.
7. (Previously Presented) The piezoelectric vibrator of claim 1,

wherein the principal vibration of the piezoelectric plate is a second overtone mode of the thickness longitudinal vibration.
8. (Cancelled).
9. (Currently Amended) A piezoelectric filter comprising:

a piezoelectric vibrator including:

a piezoelectric plate, having a polarization that points in a direction of a thickness of the piezoelectric plate, the piezoelectric plate having a first face and a second face;

a first electrode for covering the first face;

a second electrode for covering the second face;

a first dielectric film for covering the first electrode; and

a second dielectric film for covering the second electrode,

wherein the piezoelectric plate employs a thickness longitudinal vibration as a principal vibration,

the first dielectric film and the second dielectric film have substantially a same thickness and a substantially same area,

a ratio of a sum of a thickness (t_s) of the first dielectric film and the second dielectric film to the thickness (t_p) of the piezoelectric plate is provided in a range such that an electro-mechanical coupling factor is substantially constant,

wherein the range of the ratio (t_s/t_p) ~~of the sum of the thickness of the first dielectric film and the second dielectric film to the thickness of the piezoelectric plate~~ is between 0.7 and 2.0, inclusive, and

the first dielectric film and the second dielectric film are ~~disposed~~ formed to be substantially point symmetric with each other ~~with respect to a diagonal line extending through a center of the piezoelectric plate across the first face and the second face of the piezoelectric plate.~~

10. (Previously Presented) The piezoelectric filter of claim 9,

wherein the piezoelectric vibrator includes at least two piezoelectric vibrators, and

the piezoelectric filter is a ladder type filter formed by combining the at least two piezoelectric vibrators.

11. (Cancelled).

12. (Previously Presented) The piezoelectric filter of claim 9,

wherein the piezoelectric vibrator includes a plurality of piezoelectric vibrators, and

the piezoelectric filter is a double mode filter where the plurality of piezoelectric vibrators are formed at the piezoelectric plate.

13. (Original) The piezoelectric filter of claim 12,

wherein the first electrode is divided into an electrode for inputting and an electrode for outputting, and the second electrode is used as an electrode for grounding.

14. (Currently Amended) A method of adjusting a piezoelectric vibrator, the piezoelectric vibrator comprising:

a piezoelectric plate, having a polarization that points in a direction of a thickness of the piezoelectric plate, the piezoelectric plate having a first face and a second face;

a first electrode for covering the first face;

a second electrode for covering the second face;

a first dielectric film for covering the first electrode; and

a second dielectric film for covering the second electrode;

the method comprising:

providing a ratio of a sum of a thickness (t_s) of the first dielectric film and the second dielectric film to the thickness (t_p) of the piezoelectric plate in a range such that an electro-mechanical coupling factor is substantially constant; and

adjusting a resonance frequency of the piezoelectric vibrator by changing at least one of the first dielectric film and the second dielectric film,

wherein the piezoelectric plate employs a thickness longitudinal vibration as a principal vibration,

the first dielectric film and the second dielectric film have substantially a same thickness and a substantially same area,

wherein the range of the ratio (t_s/t_p) ~~of the sum of the thickness of the first dielectric film and the second dielectric film to the thickness of the piezoelectric plate~~ is between 0.7 and 2.0, inclusive, and

the first dielectric film and the second dielectric film are formed to be disposed substantially point symmetric with each other ~~with respect to a diagonal line extending through a center of the piezoelectric plate across the first face and the second face of the piezoelectric plate.~~